

Research on Hospital Financial Risk Identification and Control Strategies

Yuanwei Li

West China Second University Hospital, Sichuan University, Chengdu, Sichuan, China.

Abstract: This research delves deeply into the intricacies of identifying and controlling financial risks in hospitals, shedding light on the profound implications these risks bear on the sustainable development of healthcare institutions. The focus on financial risk identification employs a sophisticated approach incorporating data analysis technology, expert systems, and model construction, resulting in the establishment of a comprehensive and adaptable financial risk identification model. Regarding financial risk control, a proposed financial risk control framework underscores the significance of internal control mechanisms, adherence to external norms, and the integration of information technology for cohesive risk management. The analysis extends to specific strategies such as risk sharing, transfer, proactive risk warnings, and adept emergency responses, all strategically aimed at fortifying the hospital's financial resilience and solidity. This thorough examination, presented in the entirety of the paper, equips hospital managers with a solid foundation for informed decision-making, ultimately catalyzing the modernization and refinement of financial management practices within healthcare institutions.

Keywords: Hospital Financial Risk; Risk Identification; Risk Control; Data Analysis Technology; Expert System; Risk Sharing And Transfer; Risk Warning And Emergency Response; Sustainable Financial Development; Information Technology

1. Introduction

In today's rapidly developing medical industry, hospitals, as the main institutions providing medical services, bear important social responsibilities. However, with the continuous innovation of medical technology and the growing demand for medical services, hospitals are facing an increasingly complex financial environment and risk challenges. The dilemma of hospital financial management is not only due to rising medical costs, but also affected by various factors such as adjustments to medical insurance policies, uncertainty about patients' ability to pay, and medical liability disputes. This makes the hospital's finances face huge uncertainty, and financial risks have become increasingly prominent^[1].

This study was motivated by concerns about hospital financial sustainability. As competition in the medical market becomes increasingly fierce, hospital financial health has become the focus of medical managers. How to better identify hospital financial risks and formulate effective control strategies has become an urgent problem that needs to be solved. Relying solely on traditional financial management methods is no longer sufficient to deal with the diversified and complex risks faced by hospitals. Therefore, conducting in-depth research on hospital financial risks and exploring their identification and control strategies has important theoretical and practical significance for improving hospital financial stability and sustainability^[2].

In the current situation where hospital finance is facing multi-faceted pressure, this study aims to answer the following core questions: What are the main characteristics of hospital financial risks? What are the relationships and impacts between these characteristics? How to scientifically and effectively identify hospital financial risks and formulate practical control strategies based on identification? At the same time, this study also aims to clarify the specific goal of the research, which is

to propose a highly operable and widely applicable financial risk control strategy based on an in-depth analysis of hospital financial risks to promote the steady development of hospital finance^[3]. Through systematic theoretical construction and empirical analysis, this study aims to provide scientific decision-making basis for hospital managers and promote the modernization and refined development of hospital financial management^[4].

2. Overview of Hospital Financial Risks

As an important part of social services, hospitals are facing increasingly severe challenges in their financial management, and financial risks have become a major factor restricting the sustainable development of hospitals^[5]. First, the concept of hospital financial risk encompasses a variety of factors that may negatively impact a hospital's financial stability^[6]. These factors include, but are not limited to, rapid increases in medical costs, continuous updates in medical technology, adjustments in medical insurance policies, and uncertainty in patient payments. This multifaceted uncertainty makes hospitals face multi-level, complex and changeable risks in financial management, which requires a systematic theoretical framework and scientific methods to solve. An overview of hospital financial risks needs to take into account their profound impact on the hospital's economic ecosystem^[7]. As a service institution, the financial health of a hospital is directly related to the sustainability and social benefits of medical services^[8]. On the one hand, hospital financial instability will lead to irrational allocation of medical resources, affecting the accessibility and quality of medical services; on the other hand, financial risks may also lead to hospital debt problems and declining economic benefits, thus affecting the hospital's social Fulfillment of responsibilities. Therefore, an in-depth understanding of the hospital's financial risk profile will help to better understand the challenges that hospitals face in financial management and provide them with more scientific financial risk management strategies. An overview of hospital financial risks also needs to take into account the impact of changes in the environment within and outside the industry on financial risks^[9]. With the continuous evolution of the medical industry and increasingly fierce market competition, hospital financial risks have shown new characteristics and trends. For example, the introduction of emerging medical technologies may bring high equipment investment and operating costs, while adjustments to medical insurance policies may have a profound impact on a hospital's financial structure. Taking into account factors both inside and outside the industry, an overview of hospital financial risks will help establish a comprehensive and systematic risk identification model, providing strong theoretical support and practical guidance for hospital financial management. This comprehensive and in-depth perspective helps deepen the understanding of hospital financial risks and provides a foundation and guidance for formulating effective financial risk management strategies^[10].

3. Hospital Financial Risk Identification

3.1 Financial Risk Identification Model

The financial risk identification model is a key tool in hospital financial management. Its design and application directly affect the hospital's grasp of potential financial risks and subsequent decision-making. In the face of increasingly heavy financial work and diversified risk sources, it is particularly urgent to establish a scientific and effective financial risk identification model.

The construction of a financial risk identification model requires comprehensive consideration of multiple factors in hospital financial operations. This includes but is not limited to financial statement data, economic environment, demand for medical services, patient payment levels, etc. Through systematic integration and analysis of these data, an indicator system that can comprehensively reflect the hospital's financial status is constructed. This indicator system must be sensitive and able to capture early signals of financial risks, and it must also be comprehensive and able to comprehensively assess the overall financial status of the hospital. The design of financial risk identification models requires the combination of advanced data analysis techniques. Traditional financial analysis methods can no longer meet the needs for in-depth analysis of complex financial environments. With the help of technologies such as big data, artificial intelligence and machine learning, the patterns and trends behind financial data can be more accurately mined. By establishing data models and prediction models, the accuracy of predictions of potential financial risks can be improved, helping to take targeted response measures in advance. Financial risk identification models should be flexible and adjustable. The financial environment and risk sources may change

at different times, and it is difficult for a fixed model to adapt to the complex and ever-changing medical market. Therefore, the adaptability in different situations must be taken into account when designing the model, and it can be adjusted and updated in time according to changes in the external environment to ensure that it continues to function effectively.

The establishment of a financial risk identification model requires the comprehensive application of principles such as data integration, advanced technology, and flexible design to more comprehensively and accurately reflect the hospital's financial status and provide strong support for subsequent financial risk management. The successful application of this model will help improve the hospital's sensitivity and response capabilities to financial risks and lay a solid foundation for the hospital's sustainable development.

3.2 Hospital Financial Risk Identification Methods

The choice of hospital financial risk identification method is crucial and is directly related to the comprehensive grasp and effective management and control of potential risks. In today's information and intelligence era, the application of data analysis technology in financial risk identification has become an indispensable key means.

Data analysis technology plays an important role in financial risk identification. Through the collection, integration and analysis of large amounts of financial data, we can deeply explore the relationships and trends behind the data. Based on statistics, machine learning and other methods, data analysis technology can help hospitals establish financial risk prediction models and identify potential anomalies and risk signals. For example, through in-depth mining of historical data, some financial anomalies that are not easy to detect can be discovered, thereby providing early warning of potential risks and providing a more accurate reference for hospital decision-making. The application of expert systems and models has unique advantages in financial risk identification. Expert systems combine professional domain knowledge and artificial intelligence technology to simulate the decision-making process of professionals. In financial risk identification, the expert system can automatically conduct risk assessment and classification based on financial professional knowledge and rules, improving the accuracy and efficiency of financial identification. At the same time, the application of the model can comprehensively analyze various indicators in the financial system through methods such as mathematical modeling and simulation, and classify risk levels based on the output results of the model, providing hospitals with a more systematic and scientific financial risk identification solution. The combined application of these two methods can reveal potential risks in financial operations more comprehensively. By mining the information behind big data using data analysis technology, and combining it with intelligent analysis of expert systems and models, hospitals can gain a more comprehensive understanding of the operating status of the financial system, which helps to identify and assess potential risks in a timely manner. This comprehensive application not only improves the accuracy of financial risk identification, but also provides the hospital with more operational risk management suggestions, providing solid support for the healthy development of the hospital's finances.

4. Hospital Financial Risk Control

4.1 Financial Risk Control Framework

The financial risk control framework is a strategic design in hospital financial management, aiming to establish a systematic and organic control mechanism to standardize and guide the hospital's response behavior when facing various financial risks. Within this framework, a series of links from internal management to external supervision are covered to comprehensively ensure the sound and sustainable development of the hospital's finances.

The core of the financial risk control framework lies in establishing a sound internal control mechanism. This includes a comprehensive review and optimization of the hospital's internal financial processes to ensure that every financial decision is subject to strict review and monitoring. In this internal control mechanism, information transparency and the authenticity and credibility of financial reports need to be emphasized to increase internal and external trust in the hospital's financial status. At the same time, we strengthen financial training and awareness-building for internal personnel so that they can better understand and perform financial management responsibilities and form a financial risk control situation in which all employees participate. The financial risk control framework also needs to take into account the role of external supervision and regulation. The particularity of the medical industry requires hospitals to strictly follow relevant regulations and policies

in financial management. Therefore, the financial risk control framework needs to fully integrate and reflect these external requirements. This includes, but is not limited to, financial reporting standards, changes in tax policies, and regulations on pricing of medical services. By establishing a financial risk control framework that is compatible with the external environment, hospitals can better comply with regulations, avoid potential risks, and effectively respond to changes in the external environment. The financial risk control framework needs to focus on the application of information technology. With the continuous advancement of science and technology, informatization has become an important means of financial management. Hospitals can realize real-time monitoring and analysis of financial data and improve their sensitivity to financial risks by establishing a financial information system. At the same time, informatization can also provide a more convenient platform for internal and external communication and enhance the real-time and proactive nature of financial risk control. Within this overall financial risk control framework, internal and external factors are organically combined to form a synergy aimed at comprehensively preventing and controlling the financial risks that the hospital may face from multiple levels. The establishment of this framework not only helps to improve the safety and soundness of hospital finances, but also lays a solid foundation for the long-term development of hospital financial management.

4.2 Hospital Financial Risk Control Strategy

4.2.1 Risk Sharing and Transfer

The importance of hospital financial risk control strategies is reflected in its ability to help hospitals respond flexibly and efficiently when faced with various risks, among which risk sharing and transfer is a key strategic choice. Risk sharing is an important strategy in hospital financial management. Through a reasonable risk sharing mechanism, the hospital can reasonably allocate potential financial risks among various relevant parties. This includes transparent and fair relationships with healthcare providers, insurance companies, investors and other partners. By establishing long-term and stable supply chains and strategic partnerships, hospitals can diversify financial risks to a certain extent and ensure that they can be mitigated when faced with market fluctuations or uncertainties. Risk transfer is another important direction of financial risk control strategy. By purchasing financial insurance or signing financial derivatives contracts with financial institutions, hospitals can transfer specific financial risks to professional institutions and reduce their own burdens. For example, hospitals can purchase business interruption insurance to cover financial losses caused by emergencies. This risk transfer strategy not only helps reduce the hospital's financial risk exposure, but also improves overall financial security. When formulating risk sharing and transfer strategies, hospitals need to comprehensively consider the nature and probability of various risks, and make flexible and scientific choices based on their own financial status and operating characteristics. At the same time, it is recommended that hospitals, while establishing long-term cooperative relationships with external partners, clarify the risk sharing clauses in the contracts to ensure that there is a clear division of responsibilities and negotiation mechanisms when risk events occur. This proactive and strategic risk management helps hospitals better cope with uncertainty and improve the resilience and sustainability of their financial operations. By skillfully and flexibly using risk sharing and transfer strategies, hospitals can better balance the financial interests of all parties and ensure they maintain a sound financial position in the complex and ever-changing medical market.

4.2.2 Risk Warning and Emergency Response

Risk warning and emergency response are key links in hospital financial risk control. Through timely monitoring and rapid response, hospitals can more effectively resolve potential financial risks and ensure stable financial operations.

The establishment of a risk early warning mechanism is crucial to hospital financial management. By formulating a scientific and reasonable risk warning indicator system, hospitals can detect signs of problems before financial risks occur. This includes, but is not limited to, monitoring of key financial indicators, market environment, and policies and regulations. With the help of modern information technology, hospitals can establish a real-time monitoring system for financial data, achieve timely summary and analysis of key data, and provide solid data support for early warning of financial risks. At the same time, risk warning also needs to be combined with industry development trends and changes in the external environment to fully grasp the possible occurrence of financial risks. The emergency response mechanism is an extension of risk warning and is crucial to the timely handling of financial risks. Hospitals need to establish a comprehensive emergency response process to ensure that they can respond quickly when financial risks occur. This includes but is not limited to the establishment

of a financial crisis management team, the formulation of emergency plans, and the clarification of emergency decision-making mechanisms. When financial risks occur, hospitals need to quickly mobilize resources from various departments and implement reasonable and effective measures to resolve and respond to the crisis and reduce losses. At the same time, we must pay attention to timely communication and transparency, maintain close contact with all stakeholders, and form a collaborative posture to jointly respond to the challenges of financial risks. In risk warning and emergency response, hospitals need to focus on the timely transmission of information and team coordination to ensure that the handling of financial risks is efficient and collaborative. This proactive risk management strategy helps reduce the adverse impact of financial risks on the hospital and improves the overall financial security and resilience of the hospital. By establishing a comprehensive risk warning and emergency response mechanism, the hospital can respond to changes in the financial environment more flexibly and quickly, ensuring the sustainable development of the hospital's finances.

5. Summarize

This paper focuses on the identification and control of hospital financial risks, and provides an in-depth analysis of the various influencing factors of financial risks in the medical industry. In terms of hospital financial risk identification, by building a financial risk identification model and using a combination of data analysis technology and expert systems, we can gain a comprehensive and in-depth insight into the hospital's financial environment, providing strong support for early warning of risks. In terms of financial risk control, the financial risk control framework and strategies are introduced in detail, emphasizing the synergy of internal control mechanisms, external norm compliance, and information technology. Special attention was paid to the two strategies of risk sharing and transfer, and risk warning and emergency response, to enhance the hospital's financial resilience and soundness through risk diversification and flexible response mechanisms. In summary, this study is committed to providing hospital managers with a comprehensive financial risk management solution and promoting hospital financial management to a higher level of sustainable development.

References

- [1] Cole E S, Walker D, Mora A, et al. Identifying hospitals that may be at most financial risk from Medicaid disproportionate-share hospital payment cuts[J]. *Health Affairs*, 2014, 33(11): 2025-2033.
- [2] Munoz E, Rosner F, Friedman R, et al. Financial risk, hospital cost, and complications and comorbidities in medical non-complications and comorbidity-stratified diagnosis-related groups[J]. *The American journal of medicine*, 1988, 84(5): 933-939.
- [3] Ernst C, Szczesny A. Capped hospital budgets, risk-influencing activities and financial consequences[J]. *Journal of Accounting and Public Policy*, 2008, 27(1): 38-61.
- [4] Gajadien C S, Dohmen P J G, Eijkenaar F, et al. Financial risk allocation and provider incentives in hospital-insurer contracts in The Netherlands[J]. *The European Journal of Health Economics*, 2023, 24(1): 125-138.
- [5] van Leeuwen L V L, Mesman R, Berden H, et al. Reimbursement of care does not equal the distribution of hospital resources: an explorative case study on a missing link among Dutch hospitals[J]. *BMC Health Services Research*, 2023, 23(1): 1007.
- [6] Khullar D, Bond A M, Schpero W L. COVID-19 and the financial health of US hospitals[J]. *Jama*, 2020, 323(21): 2127-2128.
- [7] Thomas S, Pink G, Reiter K. Characteristics of communities served by rural hospitals predicted to be at High risk of financial distress in 2019[J]. *North Carolina Rural Health Research Program*, 2019.
- [8] Koola J D, Ho S B, Cao A, et al. Predicting 30-day hospital readmission risk in a national cohort of patients with cirrhosis[J]. *Digestive diseases and sciences*, 2020, 65: 1003-1031.
- [9] Bassett H K, Collier R J, Beck J, et al. Financial difficulties in families of hospitalized children[J]. *Journal of Hospital Medicine*, 2020, 15(11): 652-658.
- [10] Borsa A, Bejarano G, Ellen M, et al. Evaluating trends in private equity ownership and impacts on health outcomes, costs, and quality: systematic review[J]. *bmj*, 2023, 382.